

**RECOVERY PROGRAM  
FY 2020-2021 SCOPE OF WORK for:**

Recovery Program Project Number: 169

Monitoring spawning aggregations on the Green and Yampa rivers with antennas.

Reclamation Agreement number:

Reclamation Agreement term:

Note: Recovery Program FY20-21 scopes of work are drafted in May 2019. They often are revised before final Program approval and may subsequently be revised again in response to changing Program needs. Program participants also recognize the need and allow for some flexibility in scopes of work to accommodate new information (especially in nonnative fish management projects) and changing hydrological conditions.

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Category:

- Ongoing project
- Ongoing-revised project
- Requested new project
- Unsolicited proposal

Expected Funding Source:

- Annual funds
- Capital funds
- Other [*explain*]

I. Title of Proposal: Monitoring spawning aggregations on the Green and Yampa rivers with antennas.

II. Relationship to RIPRAP:

General Action Plan:

V.A.1.a.(2) Investigate improving recapture rates through passive PIT tag monitoring to improve population abundance estimates

Green River Action Plan:

V.D.1. Implement razorback sucker monitoring plan

III. Study Background/Rationale and Hypotheses:

Researchers monitor endangered fishes in the Upper Colorado River Basin. Periodic population abundances are estimated using capture-recapture techniques. This type of estimation requires that marked animals are recaptured in some way, and the more recaptures, the higher the precision of the estimate. Precise population estimates allow managers to be more confident about the status of the species in question.

In recent years, Colorado pikeminnow monitoring efforts have provided researchers with enough data to generate population estimates, however, captures and recaptures have been declining, and more recaptures are desired for better precision (K. Bestgen, personal communication). Razorback sucker are captured while conducting work to estimate Colorado pikeminnow. However, recaptures for this species are insufficient to generate a precise population estimate. Managers have identified a need to increase razorback sucker recaptures to thus generate population parameters (Bestgen et al. 2012). This study was initiated with this purpose: to document as many razorback sucker detections as possible in an attempt to generate data that can be used for estimating populations and survival using PIT tag antennas/Passive Interrogation Arrays (PIA). Added detections of PIT-tagged Colorado pikeminnow could also provide more robust population estimates of this long-lived species.

#### IV. Study Goals, Objectives, End Product(s):

##### Goals:

1. To detect as many endangered fish as possible at Razorback Bar, Cleopatra's Couch bar, and Echo Park bar.
2. Find other locations where PIT tag antenna technology can be used to obtain more detections, such as Douglas Creek and floodplain wetlands.
3. Assist hatchery managers in determining the efficacy of fish rearing and stocking methods by determining the level of representation of hatchery fish cohorts within single and multi-year antenna datasets.

##### Objectives:

1. Deploy PIA's at Razorback Bar, Cleopatra's Couch bar, and Echo Park bar.
2. Supplement traditional sampling gear at floodplain wetlands such as Johnson Bottom, Old Charley Wash, and Sheppard Bottom with PIA's.

End products: All detection data will be provided electronically to the Recovery Program database for future survival estimates. This project is not intended to estimate razorback sucker survival in and of itself, but rather to augment other datasets (ancillary captures through pikeminnow estimates and nonnative fish removal). We will also provide results of our findings in the form of an annual report.

#### V. Study Area:

Razorback Bar near Jensen, Utah, Echo Park and Cleopatra's Couch bars on the Yampa River in Dinosaur National Monument, Colorado, and other locations along the Green, White, and Yampa rivers.

#### VI. Study Methods/Approach:

Multiple 40" x 6" submersible antennas will be deployed in riverine and floodplain habitats in the middle Green River Basin. Since most of the spawning bars we sample are located within Dinosaur National Monument, we have acquired sampling permits from the National Park Service. We will deploy antennas several weeks before flows begin to rise on Razorback and

Echo Park bars (typically late March or early April) to detect spawning razorback sucker. Detection of PIT-tagged Colorado pikeminnow will be attempted once peak flows begin to subside in the Yampa River (typically in early June). We will also deploy submersible antennas at Cleopatra’s Couch bar, which will coincide with an early pass on Project 110, which allows access to this location. The PIAs at Echo Park bar will additionally serve to detect Colorado pikeminnow in the Green-Yampa River confluence vicinity.

The standalone nature of submersible PIAs creates a much smaller footprint compared to antennas that require shore-based infrastructure, which makes them desirable in rivers that are managed as wilderness, such as the Yampa River and the Green River above the Split Mountain boat ramp in Dinosaur National Monument. We will use appropriate lengths of weighted 1/8” wire rope to secure submersible PIAs to a fixed natural object on shore that will allow for easy retrieval and eliminate the chance of losing the antenna to the current. We will also attach an identification tag to the shore end of the anchor that will explain its purpose and provide our contact information to anyone interested. Batteries will be changed bi-weekly by driving to Echo Park and hiking batteries to/from the antenna, driving a john boat to Razorback Bar, or stopping at Cleopatra’s Couch and Echo Park bars during Project 110 passes. Data retrieval will also occur during these weekly maintenance visits.

VII. Task Description and Schedule:

Task 1: Document razorback sucker and Colorado pikeminnow on or near spawning bars

Task 2: Data Analysis, report writing, presentations.

Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1				X	X	X	X					
2									X	X	X	X

VIII. Deliverables, Due Dates, and Budget by Fiscal Year:

Annual report and data submissions to STReAMS by November of each year. Submission of 8-12 photos of project components or individuals completing tasks in conjunction with annual reports. Photos may be submitted to [Melanie\\_fischer@fws.gov](mailto:Melanie_fischer@fws.gov) or through the Program’s flicker account.

IX. Budget Summary:

<b>Fiscal Year</b>	<b>FY Total</b>
FY 2020	\$ 33,349
FY 2021	\$ 32,663
FY 2022	\$ 33,305
FY 2023	\$ 33,971
FY 2024	\$ 36,076
<b>TOTAL</b>	<b>\$ 169,364</b>

X. Reviewers:

XI. References:

Bestgen, K. R., K. A. Zelasko, and G. C. White. 2012. Monitoring reproduction, recruitment and population status of razorback suckers in the upper Colorado River Basin. Report to the Upper Colorado River Endangered Fish Recovery Program. Larval Fish Laboratory Contribution 170, Colorado State University, Fort Collins.

Webber, P.A. and D. Beers. 2014. Detecting razorback suckers using passive integrated transponder tag antennas in the Green River, Utah. *Journal of Fish and Wildlife Management* 5: 191-196.

Webber, P. A., P. D. Thompson and P. Budy. 2012. Status and structure of two populations of bluehead suckers (*Catostomus discobolus*) in the Weber River, Utah. *Southwestern Naturalist* 57(3):267-276.